S0370121
Task ID# 7241
cc: Mike



**APPLICANT RESPONSE TO COMMENTS**
**INITIAL REVIEW OF SURETY ESTIMATE**
**TO COMMENCE SMALL MINING OPERATIONS**
**Energy Fuels Resources (USA), Daneros Mine, S/037/0121**
**March 2016**

## General Comments:

| Comment # | Sheet/Page/ Map/Table # | Comments | Initials | Review Action |
|---|---|---|---|---|
| 1 | General | The Division may have additional comments based on the responses to this review. Please attempt to provide a complete, technically adequate submittal. | OGM | |

## R647-4-113 – Surety

| Comment # | Sheet/Page/ Map/Table # | Comments | Initials | Review Action |
|---|---|---|---|---|
| 2 | General | *Costs provided are for 2014, not 2015. Because the costs are very similar to costs for 2015, recalculation will not be needed. Cost data is now available for 2016 which could be used to escalate the cost estimate to 2021.*<br><br>The RS Means unit costs were updated using the 2016 estimates. | pnb | |
| 3 | 3.0 Summary | *The amount of revegetation cost is different than on the Bonding Calculation Summary Sheet, and the total bond amounts are also different. Correct both sheets.*<br><br>This has been corrected. | pnb | |
| 4 | Bonding Calculation Summary | *The escalation factor for 2015 and early 2016 is 1.2%, not 0.5%. Correct the factor, which affects the total bond amount.*<br><br>The escalation factor has been corrected. | pnb | |
| 5 | Mob & Demob | *Identify the source for the mobilization and demobilization costs. Mobilization of up to five pieces of equipment (LHD, dozer, loader, excavator, and truck) likely would cost significantly more than $4,500, depending on the assumptions. The Division typically assumes mobilization and demobilization are 10% of the direct costs.*<br><br>A mobilization and demobilization cost estimate break-down table has been included in the cost estimate. It is based on vendor quotations. The mob/de-mob costs are now estimated to be $11,866. | pnb | |

| Comment # | Sheet/Page/ Map/Table # | Comments | Initials | Review Action |
|---|---|---|---|---|
| 6 | Demo & Removal | *The following R.S. Means line item is more appropriate for culvert removal, though neither cost code includes excavation: 02 41 13 40 0180.*<br><br>Note that the three culverts spanning Bullseye Canyon will remain in place at the request of San Juan County (letter included in this submittal). There is one each, 36-inch diameter, 30-ft long culvert to be removed. This culvert is half buried and will be easy to remove. This culvert carries storm drainage from offsite under the laydown yard and into Bullseye Canyon. An appropriate RS Means reference number that also includes excavation could not be found. We estimated that it will take 2.5 hours of D-7 Dozer machine time to remove this culvert, crush it, and drag it to the development rock area where it will be buried with the final grading activities. | pnb | |
| 7 | Demo & Removal | *The cost code used for pre-engineered buildings does not include removal costs. The following section of R.S. Means line items is more appropriate for building demolition: 02 41 16 13 0500.*<br><br>The suggested RS Means reference number has been used to estimate demolition costs. The disposal costs have also been estimated separately in Task P1. | pnb | |
| 8 | Demo & Removal, Concrete | *The following section of R.S. Means line items is more appropriate for demolition of concrete pads and other structures associated with buildings: 02 41 16 17.*<br><br>The suggested RS Means reference number has been used. | pnb | |
| 9 | Omission | *Clarify the disposal method for demolished concrete (e.g. floors) and include the respective costs.*<br><br>Concrete pads will be broken into manageable pieces and placed in the development rock area prior to final grading. This is now described in Task P2. | pnb | |
| 10 | Tank Removal | *For disposal of fuel tanks, please use Means cost 02 65 10.30 and include removal of sludge and product, transportation, disposal of tank at a certified facility, and any other related costs.*<br><br>This has been done. | pnb | |
| 11 | Water Well Closure | *Please state how many wells are wet (encounter significant water) and how many are dry. For wet holes use Means 33 21 13.10 8520. Wet holes must be filled with cement or bentonite at least fifty feet above and below the aquifer. A drill rig must be used to ensure proper well plugging.*<br><br>There is only one well and it is referred to as the Daneros Well. This is a wet hole and this is now labeled on the table. Due to the depth of the well, a drill rig will be used to verify proper abandonment. Although the RS Means reference number 33 21 13 10 exists in the 2016 RS Means book (74th edition), we could not locate line item 8520. We could not find an appropriate reference number in this section to use. We have estimated appropriate well reclamation to cost $6.00/ft based on our experience ($10,000 total excluding mobilization). | pnb | |

| Comment # | Sheet/Page/ Map/Table # | Comments | Initials | Review Action |
|---|---|---|---|---|
| 12 | Water Well Closure | *Include a cost for mobilization of appropriate equipment capable of abandoning a water well of this depth.*<br><br>The cost of contractor mob/de-mob (including drill rig) is estimated to be $2,500 and this has been included in the overall project mob/de-mob costs. | pnb | |
| 13 | Water Well Closure | *Clarify which water well will need to be abandoned, since two are shown on the Notice maps.*<br><br>Please see Comment 11. | pnb | |
| 14 | Omission | *Provide costs for removal of introduced deleterious materials (such as fuels and chemicals) that present at the site, including underground.*<br><br>There will be no fuel or chemical tanks stored underground. The costs for removal of fuel sludge and barrels of oil is included in Task P4. The costs for removal of non-metallic debris and shop supplies is included in Task P1. | pnb | |
| 15 | Hazardous Materials | *Please include costs for pre-demolition building surveys for asbestos and universal hazardous wastes as required by NESHAPS and Utah DAQ / DEQ.*<br><br>The mine shop and office trailer were constructed/purchased new in 2008 and 2009. EFR believes that testing is unnecessary due to the age of the buildings. | mpb | |
| 16 | Hazardous Materials | *Please include a cost estimate for removal and disposal of regulated hazardous materials on site.*<br><br>None are expected. | mpb | |
| 17 | Omission | *Include costs to remove generators and compressors, as needed.*<br><br>All mobile equipment and fixed equipment is assumed to be in working order and to have salvage value. The fixed equipment includes generators, compressors, ventilation fans, and pumps. The salvage value has not been included in the bond estimate. However, the cost of disposing of these items has been assumed to be zero since they have value above and beyond the costs to remove them. | pnb | |
| 18 | Omission | *Include costs to remove significant underground mine equipment and machinery.*<br><br>Please see comment #17. | pnb | |
| 19 | Earthwork, Omission | *The portal sealing (backfill) costs are for one portal. Revise the calculations to include a second portal.*<br><br>The calculation now includes two portals. | pnb | |

| Comment # | Sheet/Page/ Map/Table # | Comments | Initials | Review Action |
|---|---|---|---|---|
| 20 | Earthwork, Calculation | *For a 2.5 cu yd LHD (ST-2D), please use costs from Blue Book 2015: $3,830.00 monthly rate (176 hrs/month). The operating cost is $30.00/hour. Add 10% to the rental rate and operating cost for overhead and profit. Use the Means labor rate of $74.15 which includes overhead and profit. Please contact the Division for explanation of how to include overhead and profit.*<br><br>EFR has used 2016 equipment rental quotes from Wheeler (a large equipment dealer in Utah with a rental store in Moab) for estimating rental costs and mobilization. The quoted rental costs from Wheeler are generally higher than from the "Blue Book". The quotes from Wheeler include all operating and maintenance costs except fuel, tire wear, ground engaging tool wear, and oil changes. The operating and maintenance costs for these items have been estimated using vendor quotations and guidance as well as the Caterpillar Handbook, V45. A table has been included in the calculation section showing the rental rate, operating/maintenance cost estimate, mobilization costs, and the assumptions made. EFR has increased all rental and operating cost estimates by 10% as suggested by DOGM.<br><br>EFR believes that the union labor rates quoted in RS Means are not applicable for the southern Utah area. Southern Utah is not a traditional labor union area, and the RS Means data provided no adjustments for non-union labor. The RS Means data is based on averages for 30 large cities nation-wide and provides for no adjustments for rural areas outside of the four major population centers in central and northern Utah. The labor rates used for this estimate are the same as EFR is paying its workforce at the White Mesa Mill in Blanding Utah. EFR believes these rates are competitive with other industrial employers in the area. Contractors completing the reclamation work for the State would be able to access this labor pool at the existing rates and avoid the excessive union rates and per diem rates for out of area or out of State workers. Based on the foregoing, EFR believes the labor rates used in this cost estimate are adequate. A labor rate table has been included.<br><br>The overall approach used here for equipment and labor costs is the same as used in the surety bond estimate for the White Mesa Mill and submitted to the DWMRC (Utah DEQ, Division of Waste Management and Radiation Control).<br><br>Please note that for the 1.5 CY LHD costs, EFR has used costs for a CAT 966 loader (a much larger machine). | pnb | |
| 21 | Earthwork, Calculation | *For a D7 dozer please use costs from Blue Book 2015: $15,875.00 monthly rate (176 hrs/month). The operating cost is $76.20/hour. Add 10% to the rental rate and operating cost for overhead and profit. Use the Means labor rate of $74.15 which includes overhead and profit. Please contact the Division for explanation of how to include overhead and profit.*<br><br>Please see comment #20. | pnb | |

| Comment # | Sheet/Page/ Map/Table # | Comments | Initials | Review Action |
|---|---|---|---|---|
| 22 | Earthwork, Calculation | *For 966H please use costs for Bluebook 2015: $8,250.00 monthly rate (176 hrs/month) operating costs $58.70/hr, and 10% to the rental rate and operating cost for overhead and profit. Use Means labor $74.15 which includes overhead and profit. Please contact the Division for explanation of how to include overhead and profit.*<br><br>Please see comment #20. | pnb | |
| 23 | Earthwork, Omission | *Production for the dozer for grading of the rock pile assumes 0% grade. Since the rock pile slopes at the angle-of-repose to the drainage, and can't permanently be pushed down into the drainage, material will need to be moved from the angle-of-repose slope to the top of the dump in order to achieve slopes of 3H:1V. With a dozer, this would require pushing material uphill. The production factor will drop significantly, and costs increase for this type of regrading. Re-evaluate methods for reclamation and adjust the costs accordingly.*<br><br>The productivity for the up-hill push has been cut in half. | pnb | |
| 24 | Earthwork, Omission | *Identify the haul distances for the loader.*<br><br>The haul distances are now listed in the tables. For both the 1.5 CY LHD and the CAT 966, 400 ft haul distances are assumed in all cases. | pnb | |
| 25 | Omission | *Include the operation of the dump truck in the calculations.*<br><br>No dump trucks are planned. | pnb | |
| 26 | Equipment Rental Costs | *Mobilization of an excavator is needed for the planned work at the vent shafts, and this memo is incomplete without the excavator costs. Include costs associated with the excavator.*<br><br>A CAT 308 mini-excavator is planned to do this work. The rental costs, operating costs, and mob/de-mob costs are now included in the cost estimate. | pnb | |

# RECLAMATION COST ESTIMATE

# DANEROS MINE




**Prepared by**

**Energy Fuels Resources (USA) Inc.**

**225 Union Boulevard, Suite 600**

**Lakewood, CO 80228**

**March 2016**

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# 1.0 Introduction

The Daneros reclamation cost estimate utilizes reference materials including 2014 & 2016 RS Means, Wheeler Equipment Rental Costs, and the Caterpillar Performance Handbook, Edition 42 & 45 (Cat Handbook) to establish reclamation quantities and unit rates for the tasks described in the reclamation plan. A number of the smaller tasks were estimated on a lump sum basis based on quotes from local contractors or the company's experience on similar sites.

EFR has used 2016 equipment rental quotes from Wheeler (a large equipment dealer in Utah with a rental store in Moab) for estimating rental costs and mobilization. The quotes from Wheeler include all operating and maintenance costs except fuel, tire wear, ground engaging tool wear, and oil changes. The operating and maintenance costs for these items have been estimated using vendor quotations and guidance as well as the Caterpillar Handbook, V45. A table has been included in the calculation section showing the rental rate, operating/maintenance cost estimate, mobilization costs, and the assumptions made. EFR has increased all rental and operating cost estimates by 10% as suggested by DOGM.

The labor rates used for this estimate are the same as EFR is paying its workforce at the White Mesa Mill in Blanding Utah. EFR has increased the labor costs by 10% as suggested by DOGM.

This reclamation cost estimate quantifies the reclamation liability for the Daneros Mine.

# 2.0 Reclamation Tasks

The reclamation tasks at the Rim Mine include demolition of structures, grading, and revegetation. The methods used to estimate the reclamation costs for these tasks are described below. Mobilization and demobilization is based upon contractor quotes.

## 2.1 Demolition of Structures

Demolition costs for the buildings and other structures are estimated for each mining area. The abandonment of buildings and infrastructure have been estimated using RS Means and quotations. After selecting the unit cost estimate for a specific task, the unit cost is multiplied by the number of units for that activity. Some items are estimated by using equipment production factors from the Cat Handbook for that task and the hourly cost to operate the machinery as well as the cost to purchase and install materials. Additional details regarding demolition are provided in the estimate.

## 2.2 Grading

The grading category includes placing stockpiled ore back into the mine, sealing the portals with development rock, ripping compacted area, and contouring the DRA and other areas to achieve slopes of 3H:1V or less (except for the portal seals, which will have slopes of 2H:1V or less). The tasks in the grading category require a D-7 Track Dozer. A 1.5 cy LHD unit is used for placing a seal in the portals. A LHD is required as it is small enough to fit into the portal. The Dozer will be utilized for grading the site in preparation for final cover material placement.

The design volumes for cut and fill, reclamation areas and facility footprints were generated using AutoCAD. Geometric calculations and typical stockpile sizes for the operation were estimated based on expected operating conditions

The costs for these tasks are based on the quantity of material needed to be moved, the hourly productivity and the hourly operating cost of the equipment selected. The hourly productivity is estimated based on the Cat Handbook, which provides productivity rates for various pieces of equipment at differing operating conditions. The hourly operating costs are based on the equipment hourly rental cost, fuel consumption, maintenance costs, and operator cost. Equipment productivity estimates and hourly equipment costs are summarized in the attachments at the end of this estimate.

### 2.3 Revegetation

The revegetation category includes (1) ripping the subgrade material in preparation for cover material placement, (2) placing cover material over the development rock areas and other disturbed areas and (3) seeding. The areas that require grading are not expected to be compacted and therefore do not need ripping. An 18-inch cover of inert rock and soil will be placed over the DRAs and 6-inches of cover material will be placed over the remaining disturbed areas followed by scarification (i.e., discing) and broadcast seeding.

The costs for ripping and cover material placement are based on the hourly equipment and labor costs and the quantity of material to be moved. A 966 Rubber Tire Loader and D-7 Track Dozer are utilized in the estimate for ripping and cover material placement. The cost for seeding is based on a unit cost per area multiplied by the quantity of area to be seeded.

### 2.4 Project Indirect Costs

The project's indirect costs factors are provided by the Division of Oil, Gas and Mining. These factors were used to calculate the Contingency, Engineering Redesign, Main Office Expense, and Project Management Fee. Details of the project indirect costs are shown on the Summary worksheet.

## 3.0 Summary

Energy Fuels estimates the reclamation costs for the Daneros Mine are as follows:

- Demolition - $41,000
- Grading - $8,000
- Revegetation - $23,000
- Ventilation Shafts - $18,000
- Indirects - $35,000

Total $126,000 (total may not sum due to rounding)

Daneros Mine Bonding Calculations

Direct Costs

| | | |
|---|---|---|
| Demolition of Structures | $40,939 | |
| Regrading | $8,370 | |
| Revegetation | $23,242 | |
| Vent Shafts - Demo of Structures | $537 | |
| Vent Shafts - Excavate and Place Foam Bulkheads | $4,360 | |
| Vent Shafts - Place Concrete Covers and Backfill | $13,232 | |
| **Subtotal Direct Costs** | **$90,680** | |

Indirect Costs

| | | |
|---|---|---|
| Mob/Demob | $11,866 | 13.1% |
| Contingency | $4,534 | 5.0% |
| Engineering Redesign | $2,267 | 2.5% |
| Main Office Expense | $6,166 | 6.8% |
| Project Management Fee | $2,267 | 2.5% |
| **Subtotal** | **$27,100** | 29.9% |
| **Total Cost 2016** | **$117,780** | |
| Escalation (1.3% every year for 5 years) | $7,857 | |
| Reclamation Cost Escalated to 2021 | $125,637 | 106.7% |
| Bond Amount (rounded to nearest $1,000) | $126,000 | |

Submitted to UDOGM as Draft 3/8/16 Trey White

Reviewed Prior to Submittal Kaiwen Wu

| Demolition of Structures | Reference | Unit Cost | Unit | Quantity | Cost |
|---|---|---|---|---|---|
| Removal of Equipment and Materials | Estimate | $ 942 | Loads | 6 | $ 5,654 |
| Demolition of Concrete Pads | RSM 02 41 16 17 | $ 0.98 | SF | 2,725 | $ 2,671 |
| Demolition of Buildings | Various | Various | Various | Various | $ 8,393 |
| Asbestos Testing | | | | | $ - |
| Asbestos Removal and Disposal | | | | | $ - |
| Remove Tanks | Various | Various | Various | Various | $ 12,980 |
| Demolition of Culvert | Estimate | $ 2.50 | Hours | $175.17 | $ 438 |
| Gamma Scan | Estimated | $ 26.38 | Hours | 32 | $ 844 |
| Abandon Water Well | Estimate | $ 9,960 | EA | 1 | $ 9,960 |
| **Subtotal** | | | | | **$ 40,939** |

| Regrading | Equipment Used | Quantity | Units | Production Rate (Cy/Hr) | Production Reference | Hours Worked | Hourly Rental Cost | Hourly Operating Cost | Hourly Operator Wage | Total per Hour | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Regrade Development Rock Area | D7 | 3,960 | CY | 218 | Cat Handbook | 18.2 | $113.75 | $33.17 | $ 28.25 | $ 175 | $ 3,184 |
| Regrade Berms | D7 | 464 | CY | 436 | Cat Handbook | 1.1 | $113.75 | $33.17 | $ 28.25 | $ 175 | $ 187 |
| Place Ore Back in the Mine | 1.5 CY LHD | 1,072 | CY | 36 | Cat Handbook | 30.2 | $74.38 | $34.72 | $ 28.25 | $ 137 | $ 4,141 |
| Backfill Portals | 1.5 CY LHD | 222 | CY | 36 | Cat Handbook | 6.3 | $74.38 | $34.72 | $ 28.25 | $ 137 | $ 858 |
| **Subtotal** | | | | | | | | | | | **$ 8,370** |

| Revegetation | Equipment Used | Quantity | Units | Production Rate (Cy/Hr) | Reference | Hours Worked | Hourly Rental Cost | Hourly Operating Cost | Hourly Operator Wage | Total per Hour | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Subgrade Ripping | D-7 | 4,195 | CY | 156 | Cat Handbook | 27.0 | $113.75 | $33.17 | $ 28.25 | $ 175 | $ 4,721 |
| Placement of cover material | 966 | 7,502 | CY | 119 | Cat Handbook | 63.3 | $74.38 | $34.72 | $ 28.25 | $ 137 | $ 8,694 |
| Grading of cover material | D7 | 7,502 | CY | 436 | Cat Handbook | 17.2 | $113.75 | $33.17 | $ 28.25 | $ 175 | $ 3,016 |
| Seeding | Seeder | 231 | 1000's SQ FT | | 32921 914 0500 | | | | | 29.5 | $ 6,811 |
| **Subtotal** | | | | | | | | | | | **$ 23,242** |

## Equipment Costs

| | | With 10% Increase for Profit | | | | With 10% Increase for Profit Operating Costs per Hour | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Rental | | | | | | | | | |
| Model | Source | OPEX $/Hr | MO 176 | $/Hr | Mob/DM | Fuel | G.E.T. | Tires | U.Carr. | P.M. | Misc | Total |
| D-9 | Wheeler | $55.78 | $36,080 | $205.00 | $4,177 | $27.77 | $18.31 | $0.00 | | $3.44 | $6.25 | $55.78 |
| D7 | Wheeler | $33.17 | $20,020 | $113.75 | $3,083 | $15.04 | $9.06 | $0.00 | | $3.44 | $5.63 | $33.17 |
| 966 | Wheeler | $34.72 | $13,090 | $74.38 | $1,903 | $8.73 | $8.26 | $9.96 | | $2.77 | $5.00 | $34.72 |
| 938 | Wheeler | $20.41 | $7,150 | $40.63 | $1,477 | $4.57 | $4.53 | $4.16 | | $2.77 | $4.38 | $20.41 |
| 308 Mini Excavator | Wheeler | $34.72 | $4,730 | $26.88 | $1,477 | Operating costs based on 966 loader (conservative) | | | | | | $34.72 |

Notes:

1 Fuel Consumption rates from CAT handbook, V45, average of ranges for D9, D7, 966, and 938. Crane fuel rate is from vendor. 10cy truck fuel rate is estimate from vendor.
2 Fuel price is based on previous 12 month average from PPI. Fuel, sales, and use tax added as appropriate. ($1.87 off-road, $2.06 on-road)
3 Ground engaging tool cost estimates are from Butler. Butler says sandstone wear should be minimal, and can range from 10% to 100% wear over one month. A conservative wear rate of 75% has been used.
4 Miscellaneous costs per month are from Wheeler service manager (verbal). For large equipment plan on $1000/mo and for smaller equipment plan on $500/mo.
5 Tire costs for 966 & 938 based on quotes and 2000 hour life (conservative) from Cat Handbook, V45. 10 cy truck tire cost is an estimate.
6 Preventive Maintenance costs for D9 and 966 provided by Wheeler. D9 costs used for D7, 966 costs used for 938 and 10 cy truck.
7 10 cy truck rental rate based on 1,000 miles per week, and $100/week insurance cost
8 Undercarriage costs are included in rental rates, so not part of reclamation cost estimate
9 Crane rental costs include operator, rigger, and per diem.

Description: Support calculations for the reclamation cost estimate for the Daneros Mine Area

**Task P1: Removal of Equipment and Materials**

Assumptions

Non metallic debris will be placed in 30 cy roll-offs provided by a vendor which then dumps them at a local landfill.
Mobile equipment and major fixed equipment will be sold and will incur no disposal costs.
The 30 CY roll-off dumping fee was provided by quotation.

| Item | Quantity | 30 CY Rolloff Loads | Reference | Unit Cost | Total Cost |
|---|---|---|---|---|---|
| Non-metallic debris in buildings | Lot | 2 | Estimated | $ 942 | $ 1,885 |
| Warehouse and Shop Supplies | Lot | 1 | Estimated | $ 942 | $ 942 |
| Office Trailer after demolition | Lot | 3 | Estimated | $ 942 | $ 2,827 |
| **Total** | | **6** | | | **$ 5,654** |

**Task P2: Demolition of Concrete Pads**

Assumptions

Concrete pads will be broken into manageable pieces and placed within the Development Rock Area prior to final grading.
Costs assume 6 inch slab with rebar.

| Item | Quantity | Units | Reference | Unit Cost | Total Cost |
|---|---|---|---|---|---|
| Mine Shop (55' x 35') | 1,925 | SF | RSM 02 41 16 17 | $ 0.98 | $ 1,887 |
| Storage Shed (10' x 20') | 200 | SF | RSM 02 41 16 17 | $ 0.98 | $ 196 |
| Mine Office Trailer Slab (40' x 15') | 600 | SF | RSM 02 41 16 17 | $ 0.98 | $ 588 |
| **Total** | **2,725** | | | | **$ 2,671** |

**Task P3: Demolish Buildings**

Assumptions

Steel shop and shed buildings will be disassembled into manageable pieces and placed in the development rock area prior to final grading.
Abestos testing and handling costs are estimated to be zero. The mine shop and office trailer were purchased/constructed in 2008 and 2009 and the building materials do not contain asbestos or other hazardous wastes. The storage shed is not on-site at this time.
RS means reference 13 05 05 50 0550 was used to estimate demolition costs. $2.82 per square foot.
The office trailer disposal is shown in Task P1.

| Item | Quantity | Units | Reference | Unit Cost | Total Cost |
|---|---|---|---|---|---|
| Mine Shop (55' x 35') | 1,925 | SF | RSM 13 05 05 50 0550 | $ 2.82 | $ 5,429 |
| Storage Shed (10' x 20') | 200 | SF | RSM 13 05 05 50 0550 | $ 2.82 | $ 564 |
| Office Trailer (40'x15' x 10') | 6,000 | CF | RSM 02 41 16 13 0500 | $ 0.40 | $ 2,400 |
| Asbestos Testing (Bldgs > 15 yrs old) | - | N/A | N/A | $ - | $ - |
| Asbestos Removal & Dispoal (Bldgs > 15 yrs old) | - | N/A | N/A | $ - | $ - |
| **Total** | | | | | **$ 8,393** |

**Task P4: Remove Tanks**

Assumptions

Steel tanks will be removed from the site.

| Item | Quantity | Unit | Reference | Unit Cost | Total Cost |
|---|---|---|---|---|---|
| Water Tank (2,000 gal) remove and dispose | 1 | Ea | RSM 13 05 05 75 0520 | $ 1,300 | $ 1,300 |
| Lube/Fuel Tanks - load onto truck (500 gal ea) | 4 | Ea | RSM 02 65 10 30 | $ 835 | $ 3,340 |
| Diesel Fuel Tank - load onto truck (2000 g) | 1 | Ea | RSM 02 65 10 30 | $ 835 | $ 835 |
| Lube/Fuel Tanks - Remove Sludge, wash and clean | 5 | Ea | RSM 02 65 10 30 | $ 107 | $ 535 |
| Dispose of sludge from Lube/Fuel Tank | 25 | Gallon | RSM 02 65 10 30 | $ 6.80 | $ 170 |
| Dispose of Drums of used Oil | 10 | 55 g drums | RSM 02 81 20 10 | $ 265.00 | $ 2,650 |
| Haul Lube/Fuel tanks to certified salvage dump | 5 | Ea | RSM 02 65 10 30 | $ 830 | $ 4,150 |
| **Total** | | | | | **$ 12,980** |

**Task P5: Remove Culverts**

Assumptions

Note: the three main culverts in the main drainage channel have been requested by San Juan County to remain (letter included in this submittal). Therefore no costs are included to remove the three main draingage culverts.
There is one each, 36 inch diameter, 30 ft long culvert to be removed. This culvert is only half buried and carries storm drainage from the mine yard to the main drainage.
It is estimated that it will take 2.5 hours of D-7 Dozer machine time to remove this culvert, crush it, and drag it to the development rock area prior to final grading. The total cost per hour for the D-7 is listed on the "Daneros Breakdown Tab"

| Item | Quantity | Units | Reference | Unit Cost | Total Cost |
|---|---|---|---|---|---|
| Excavate, Remove Culvert, Backfill (D-7 Machine Time) | 2.5 | Hours | Estimated | $175.17 | $ 438 |
| **Total** | | | | | **$ 438** |

**Task P6: Abandon Water Well**

Assumptions

Abandonment work includes: 1) remove surface protective shroud, 2) filling well casing with backfill material, 3) filling last 3 ft of hole with cement grout. An appropriate RS Means reference cannot be located for this work. The cost to reclaim the one wet well is based on reclaiming wet exploration drill holes in Utah and is estimated at $6.00/ft of well including labor, equipment, and supplies. Mobilization is separate.
The well will be reclaimed using a drill rig and filling from the bottom up.

| Item | Wet or Dry | Diameter (in) | Well Depth (ft) | Unit Cost ($/ft) | Total Cost |
|---|---|---|---|---|---|
| Daneros Well (facility water well) | Wet | 7 | 1660 | $6.00 | $ 9,960 |
| **Total Materials, Labor, and Equipment** | | | | | **$ 9,960** |

**Task P7: Gamma Scan**

Assumptions

Perform Gamma scan on 50 ft center grid.
Place elevated gamma count material back underground.
Labor rate for environmental technician is $26.38 per hour.
Assumed 8-hour work days.

| Item | Quantity | Units | Reference | Unit Cost | Total Cost |
|---|---|---|---|---|---|
| Gamma Scan | 32 | Labor Hours | Estimate | $ 26.38 | **$ 844** |

**Task P8: Site Regrade**

Assumptions

Regrading will be accomplished with a D-7 sized dozer or similar.
Placing ore back into the mine and backfilling the portal will be accomplished with a 1.5 CY Load Haul Dump (LHD) unit.
The D-7 Dozer productivity has been reduced by 50% due to pushing up-hill.
Average push distances for the site berms is 100 feet.

| Item | Equipment | Quantity (CY) | Reference | Productivity (CY/HR) |
|---|---|---|---|---|
| Regrade Development Rock Area | D7-100' push | 3,960 | Cat Handbook | 218 |
| Regrade Berms | D7-100' push | 464 | Cat Handbook | 436 |
| Place Ore Back in the Mine | LHD - 400' haul | 1,072 | Cat Handbook | 36 |
| Backfill Portals (2 @ 10' x 10' x 30') | LHD - 400' haul | 222 | Cat Handbook | 36 |

**Task P9: Site Revegetation**

**Assumptions**

Subsoil ripping to 12-inches over 2 acres (mine yard area) and 20% of DRA (0.6 acres) will be ripped.
The DRA is assumed to only need 20% ripped since it will have recently been graded.
Cover material will be staged with a 966 loader and graded with D-7 Dozer.
Assumes 12 inch of cover material spreading over DRA and 6 inches over remainder of mine yard.
Cover material windrows along roads will be spread while ripping.
Seeding is assumed to cover 5.3 acres (vents, access roads, and portal area)

| Item | Equipment | Quantity | Units | Reference | Productivity (CY/HR) |
|---|---|---|---|---|---|
| Subsoil Ripping | D7 - 12" Rip | 4,195 | CY | Cat Handbook | 156 |
| Placement of cover material | 966 - 400' haul | 7,502 | CY | Cat Handbook | 119 |
| Grading of cover material | D-7 - 100' push | 7,502 | CY | Cat Handbook | 436 |
| Seeding | Seeder | 231 | 1000's SQ FT | 32921 914 0500 | N/A |

# VENTILATION SHAFTS

Description: Support calculations for the reclamation cost estimate for the Ventilation raises associated with the Daneros Mine

**Task V1: Demolition of Concrete Pads**

Assumptions

Concrete pads will be broken into manageable pieces and placed within the vent shaft prior to backfill.
Vent shroud will be reused or unbolted and cut into manageable pieces and placed in the vent.
Labor is estimated at 8 hours per vent collar to cut-up vent shroud and place down vent.

| Item | Quantity | Units | Reference | Unit Cost | Total Cost |
|---|---|---|---|---|---|
| Vent Collar Pads (2 each @ 15 SY) | 270 | SF | RSM 02 41 16 17 | $ 0.98 | $ 265 |
| Disassemble above ground structure at vents ( 2 EA) | 16 | Labor Hrs | Estimate | $ 17.03 | $ 272 |
| **Total** | | | | | **$ 537** |

**Task V2: Excavate Collar and Place Foam Bulkheads (two)**

Assumptions

Please see vent closure design drawing.
Approximately 3-inches of subsoil from the area around each vent will be removed and placed in the vent shaft.
For each collar, a 20' x 20' by 5.5 feet deep area will be excavated before placing foam bulkhead.
A caterpillar 308 mini excavator (0.3 cy bucket) with an expected productivity of 20 cy per hour will be used for excavation.
The rental and mobilization costs for the 308 excavator are from quotation. The operating costs were approximated by a 966 loader (conservative).
Labor to place foam bulkhead is estimated at 3 people for 8 hours per vent.
Each foam bulkhead inside of collar is 7 ft x 7 ft x 14 ft in size.

| Item | Equipment | Quantity | Units | Unit Cost | Total Cost |
|---|---|---|---|---|---|
| Excavation down to top of foam bulkhead (two) | Cat 308 | 163 | CY | $ 4.49 | 732 |
| Labor to place foam bulkhead | N/A | 48 | Labor Hrs | $ 18.41 | 884 |
| Foam Material Costs ($2.00 per CF) | N/A | 1,372 | CF | $ 2.00 | 2,744 |
| **Total** | | | | | **$ 4,360** |

| CAT 308 Breakdown: Hours Worked (163 / 20 cy/hr) | Hourly Rental Cost | Hourly Operating Cost | Hourly Operator Wage | Total per Hour | Total Cost |
|---|---|---|---|---|---|
| 8.1 | $26.88 | $34.72 | $ 28.25 | $ 89.85 | $ 732 |

**Task V3: Pour Concrete cover and backfill (two)**

Assumptions

Each concrete cover will be poured in place (15 ft x 15 ft x 18 inches)
A caterpillar 308 mini excavator (0.3 cy bucket) with an expected productivity of 20 cy per hour will be used for backfilling.
The rental and mobilization costs for the 308 excavator are from quotation. The operating costs were approximated by a 966 loader (conservative).
Concrete unit cost of $500/cy is assumed for labor, concrete, and forming materials.

| Item | Equipment | Quantity | Units | Unit Cost | Total Cost |
|---|---|---|---|---|---|
| Backfilling of two collars | Cat 308 | 163 | CY | $ 4.49 | 732 |
| Concrete Covers | N/A | 25 | CY Concrete | $ 500 | 12,500 |
| **Total** | | | | | **$ 13,232** |

| CAT 308 Breakdown: Hours Worked (163 / 20 cy/hr) | Hourly Rental Cost | Hourly Operating Cost | Hourly Operator Wage | Total per Hour | Total Cost |
|---|---|---|---|---|---|
| 8.1 | $26.88 | $34.72 | $28.25 | $ 89.85 | $ 732 |

**For Daneros**

| Mobilization & De-Mob Costs | | | | | |
|---|---|---|---|---|---|
| Item | Mob & De-Mob | Quantity | Total Mob / De-Mob | Reference | Comments |
| D-7 Dozer | $3,083 | 1.00 | $3,083 | Quotation | Includes permits and pilot car. |
| 966 Loader | $1,903 | 1.00 | $1,903 | Quotation | |
| LHD - 1.5 CY Loader | $1,903 | 1.00 | $1,903 | Quotation | |
| 308 mine excavator | $1,477 | 1.00 | $1,477 | Quotation | |
| Seeder | $1,000 | 1.00 | $1,000 | Estimate | |
| Well Abandonment Contractor - Dril | $2,500 | 1.00 | $2,500 | Quotation | |
| **Subtotal** | | | **$11,866** | | |

Energy Fuels, White Mesa Mill, Blanding Utah
2016 Labor Rates with Fringe

| Classification | Base $/Hr | Fringe $/Hr | Total $/Hr | with 10% Profit for DOGM $/Hr | % Fringe |
|---|---|---|---|---|---|
| Survey | $ 12.15 | $ 2.75 | $ 14.90 | $ 16.39 | 18% |
| Env. Technician | $ 19.55 | $ 4.43 | $ 23.98 | $ 26.38 | 18% |
| Engineer | $ 34.72 | $ 7.86 | $ 42.58 | $ 46.84 | 18% |
| Mechanic (Demo) | $ 12.62 | $ 2.86 | $ 15.48 | $ 17.03 | 18% |
| Electrician | $ 14.96 | $ 5.05 | $ 20.01 | $ 22.01 | 25% |
| Iron Worker | $ 22.50 | $ 13.44 | $ 35.94 | $ 39.53 | 37% |
| Laborer | $ 13.65 | $ 3.09 | $ 16.74 | $ 18.41 | 18% |
| Crane Operator | $ 22.57 | $ 5.11 | $ 27.68 | $ 30.45 | 18% |
| Eq. Operator | $ 20.94 | $ 4.74 | $ 25.68 | $ 28.25 | 18% |
| Truck Driver | $ 16.94 | $ 3.84 | $ 20.78 | $ 22.86 | 18% |

| Wheel Loader (966) Productivity Determination -400' haul | | | |
|---|---|---|---|
| **Hours per Shift, HR:** | | **8** | |
| **Work Efficiency, %:** | | **0.83** | Assumes 50 minutes/hour |
| **Average Distance, FT:** | | **400** | |
| Operator Correction Factor | Factor | 0.75 | |
| Bucket Capacity (C.Y) | | 5.00 | |
| Cycle Time (min) | | 1.58 | |
| Ideal Loader Productivity | LCY/HR | **190.4** | |
| Adjusted Loader Productivity | LCY/HR | 118.5 | |

| LHD Productivity Determination -400' haul | | | |
|---|---|---|---|
| **Hours per Shift, HR:** | | **8** | |
| **Work Efficiency, %:** | | **0.83** | Assumes 50 minutes/hour |
| **Average Distance, FT:** | | **400** | |
| Operator Ability Correction Factor | Factor | 0.75 | |
| Bucket Capacity (C.Y) | | 1.50 | |
| Cycle Time (min) | | 1.58 | |
| Ideal Loader Productivity | LCY/HR | **57.1** | |
| Adjusted Loader Productivity | LCY/HR | 35.6 | |

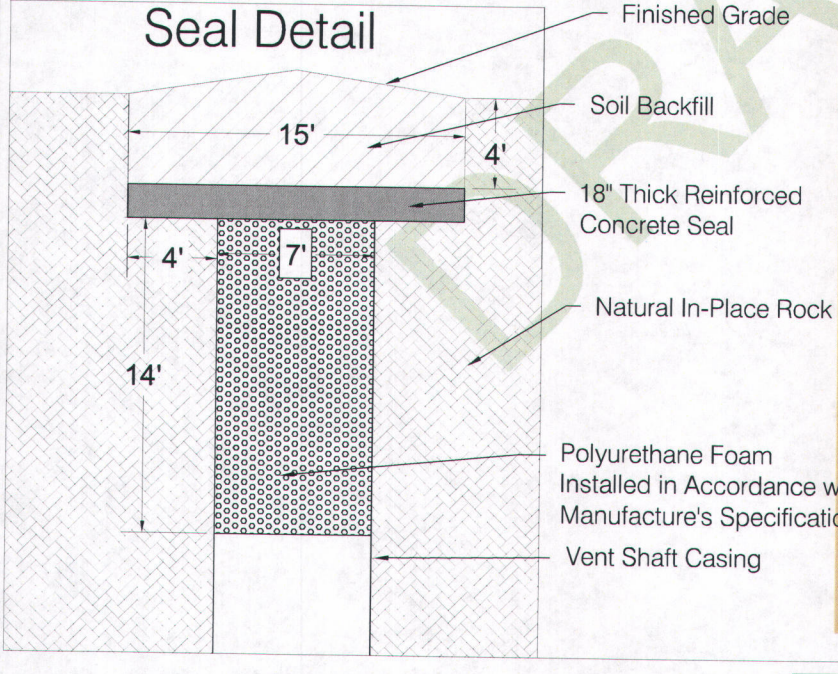
| Dozer (D-7) Productivity Determination - 100' Push Distance | | | |
|---|---|---|---|
| **Hours per Shift, HR:** | | **8** | |
| **Work Efficiency, %:** | | **0.83** | Assumes 50 minutes/hour |
| **Average Dozing Distance, FT:** | | **100** | |
| Work Efficiency | % | 83% | |
| Operator Ability Correction Factor | Factor | 0.75 | |
| Ideal Dozer Productivity | LCY/HR | **700** | *CAT Handbook* |
| Adjusted Dozer Productivity | LCY/HR | 435.8 | |

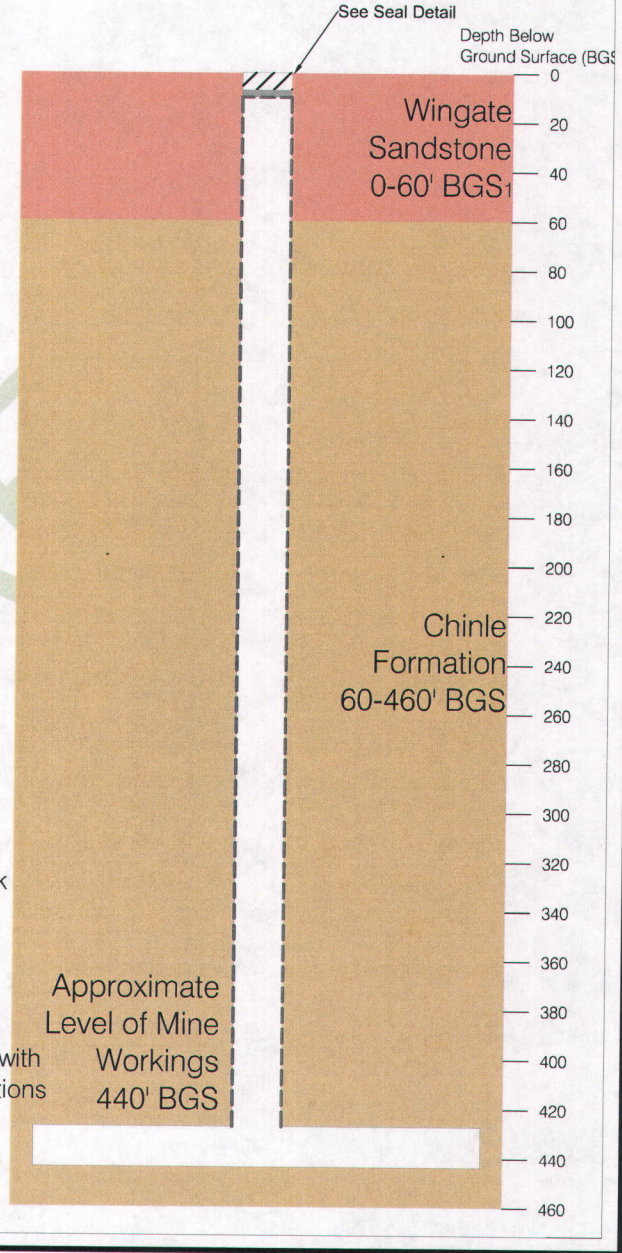
| Dozer (D-7) Ripping Productivity Determination | | | |
|---|---|---|---|
| **Hours per Shift, HR:** | | **8** | |
| **Work Efficiency, %:** | | **0.83** | Assumes 50 minutes/hour |
| **Ripping Depth (FT)** | | **1** | |
| Work Efficiency | % | 83% | |
| Operator Correction Factor | Factor | 0.75 | *The Cat Handbook does not provide a chart for a D-7. Used lowest value for D-8* |
| Ideal Ripping Productivity | LCY/HR | **250.0** | |
| Adjusted Ripping Productivity | LCY/HR | 155.6 | |

s: \source\usa\ut\daneros\maps\vent closure design\vent closure design.dwg cased vents 4-1 rellis

Notes:

1. The Wingate Sanstone varies between 0 feet and greater than 1000 feet thick in the area of the Daneros Mine.
2. The 2 existing vents are 7 feet in diameter and are cased. Future vents are expected to be 7 feet in diameter and cased. All Vents will be cased for the top 20-feet.
3. The concrete foundation for the vent fan shroud will be broken and placed within the vent shaft.
4. The vent casing will be removed to 5.5-feet below ground surface.
5. Approximately 3-inches of surface soil around the vent will be placed within the vent.
6. A bottom form will be placed to hold the initial polyurethane foam. Alternatively, the first lift of foam can be sprayed directly onto the steel casing and allowed to cure creating a stable bottom form for later lifts of foam.
7. Polyurethane foam will be placed and will extend to the top of the remaining steel casing and be a minimum of twice the diameter of the vent in thickness. For a 7-feet diameter shaft, the foam will be a minimum of 14-feet thick.
8. The 18-inch thick reinforced concrete cap will be placed on top of the foam and 4-feet below the ground surface. This cap will extend 4-feet beyond the diameter of the vent shaft.
9. The surface area above the concrete cap will be backfilled with soil and graded to drain away from the vent shaft.




Reinforced Concrete Cap

Vent Casing

Soil Cover

Energy Fuels Resources (USA) Inc.

| REVISIONS | | Project: Daneros Mine | | |
|---|---|---|---|---|
| Date | By | County: San Juan | State: Utah | |
| 10/22/14 | RE | Location: | | |

Figure 4-1
Vent Closure Design
Cased Vent Shafts

| Author: RJE | Date: 10/24/14 | Drafted By: |
|---|---|---|

# Daneros Mine
# 30 Yard Roll-off Quote

3/7/2016

Monument Waste Services LLC (Formerly Bob's Sanitation) 435-259-7585, Moab Utah

For delivery and set-up at the Daneros Mine.

- $500 initial delivery fee
- $850 haul and dump fee
- No return fee
- $3 per day rental

Mr. Mike Bradley
State of Utah Department of Natural Resources
Division of Oil, Gas and Mining
1594 West North Temple Suite 1210
Box 145801
Salt Lake City, UT 84114-5801

**REGARDING: County Road D0029 Crossing of Bullseye Drainage**

Mike:

County Road D0029, in western San Juan County, currently crosses the Bullseye drainage with three, 60 inch culverts and a raised, dirt roadbed. The culverts, and that stretch of road, are currently maintained by Energy Fuels Resources (USA) Inc. (Energy Fuels) as part of their Daneros Mine (Large Mine Notice of Intention M/037/0126). When the mine is reclaimed, the San Juan County Road Department would like the culverts and raised roadbed to remain. We will assume responsibility for their ongoing maintenance.

Please contact me if you have any questions.

Sincerely,

Lynn Laws

Lynn Laws, Superintendent
835 East Highway 666
P. O. Box 188
Monticello, UT 84535
Phone: (435)587-3230
lynnlaws@sanjuancounty.org

Cc: Ted McDougall (Bureau of Land Management) tmcdouga@blm.gov
Andrea Reither (Energy Fuels) areither@energyfuels.com